THE GROWTH OF TRUTH

HARVEIAN ORATION, 1906

OSLER

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As Illustrated in the Discovery of the Circulation of the Blood

BEING THE HARVEIAN ORATION DELIVERED AT THE ROYAL COLLEGE OF PHYSICIANS, LONDON, OCTOBER 18, 1906

BY

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I.

Only those of us, Mr. President and Fellows, who have had the good fortune to hold the distinguished position which by your kind grace, Sir, I hold to-day, only those of us who have delivered the Harveian Oration, can appreciate the extraordinary difficulties besetting a subject, every aspect of which has been considered, very often too, by men who have brought to the task a combination of learning and literary skill at once the envy and the despair of their successors. But I take it, Sir, that in this Ambarvalia or commemorative festival for blessing the fruits of our great men, ordained definitely as such by him whose memory is chiefly in our minds to-day, our presence here in due order and array, confers distinction upon an occasion of which the oration is but an incident. But, honour worthy of such a theme should be associated with full knowledge of the conditions under which these great men lived and moved; and here comes in the real difficulty, because it is rarely possible to bring the fruits of independent critical investigation into their lives and works. Particularly hard is it for those of us who have had to live the life of the arena: our best efforts bear the stamp of the student, not of the scholar. In my own case, a deep

reverence for the mighty minds of old, and a keen appreciation of the importance to our profession of a study of history, may be put in the scales against defects as to the appreciation of which I have still remaining sufficient self-detachment. The lesson of the day is the lesson of their lives. But because of the ever-increasing mental strain in this age of hurry, few of us have the leisure, fewer still, I fear, the inclination, to read it thoroughly. Only with a knowledge of the persistency with which they waged the battle for Truth, and the greatness of their victory, does the memory of the illustrious dead become duly precious to us.

History is simply the biography of the mind of man; and our interest in history, and its educational value to us, is directly proportionate to the completeness of our study of the individuals through whom this mind has been manifested. To understand clearly our position in any science to-day, we must go back to its beginnings, and trace its gradual development, following certain laws, difficult to interpret and often obscured in the brilliancy of achievements—laws which everywhere illustrate this biography, this human endeavour, working through the long ages; and particularly is this the case with that history of the organized experience of the race which we call science.

In the first place, like a living organism, Truth grows, and its gradual evolution may be traced from the tiny germ to the mature product. Never springing, Minerva-like, to full stature at once, Truth may suffer all the hazards incident to generation and gestation. Much of history is a record of the mishaps of truths which have struggled to the birth, only to die or else to wither in premature decay. Or the germ may be dormant for centuries, awaiting the fullness of time.

Secondly, all scientific truth is conditioned by the state of knowledge at the time of its announcement. Thus, at the beginning of the seventeenth century, the science of optics and mechanical appliances had not made possible (so far as the human mind was concerned) the existence of blood capillaries and blood corpuscles. Jenner could not have added to his *Inquiry* a discourse on immunity; Sir William Perkin and the chemists made Koch possible; Pasteur gave the conditions that produced Lister; Davy and others furnished the preliminaries necessary for anaesthesia. Everywhere we find this invariable filiation, one event following the other in orderly sequence—'Mind begets mind,' as Harvey says; 'opinion is the source of opinion. Democritus with his atoms, and Eudoxus with his chief good, which he placed in pleasure, impregnated Epicurus; the four elements of Empedocles, Aristotle; the doctrine of the ancient Thebans, Pythagoras and Plato; geometry, Euclid' (*De Generatione*).

And, thirdly, to scientific truth alone may the *homo mensura* principle be applied, since of all mental treasures of the race it alone compels general acquiescence. That this general acquiescence, this aspect of certainty, is not reached *per saltum*, but is of slow, often of difficult, growth—marked by failures and frailties, but crowned at last with an acceptance accorded to no other product of mental activity—is illustrated by every important discovery from Copernicus to Darwin.

The growth of Truth corresponds to the states of knowledge described by Plato in the *Theaetetus*—acquisition, latent possession, conscious possession. Scarcely a discovery can be named which does not present these phases in its evolution. Take, for example, one of the most recent: Long years of labour gave us a full know-

ledge of syphilis; centuries of acquisition added one fact to another, until we had a body of clinical and pathological knowledge of remarkable fullness. For the last quarter of a century we have had latent possession of the cause of the disease, as no one could doubt the legitimate inference from discoveries in other acute infections. The conscious possession has just been given to us. After scores of investigators had struggled in vain with the problem, came Schaudinn with an instinct for truth, with a capacity to pass beyond the routine of his day, and with a vision for the whole where others had seen but in part. It is one of the tragedies of science that this brilliant investigator, with capabilities for work so phenomenal, should have been cut off at the very threshold of his career. The cancer problem, still in the stage of latent possession, awaits the advent of a man of the same type. In a hundred other less important problems, acquisition has by slow stages become latent possession; and there needs but the final touch—the crystal in the saturated solution—to give us conscious possession of the truth. But when these stages are ended, there remains the final struggle for general acceptance. Locke's remark that 'Truth scarce ever yet carried it by vote anywhere at its first appearance' is borne out by the history of all discoveries of the first rank. The times, however, are changing; and it is interesting to compare the cordial welcome of the pallid spirochaete with the chilly reception of the tubercle bacillus. Villemin had done his great work, Cohnheim and Salmonson had finally solved the problem of infectivity, when Koch published his memorable studies. Others before him had seen the bacillus, but the conscious possession of the truth only came with his marvellous technique. Think of the struggle to

secure acceptance! The seniors among us who lived through that instructive period remember well that only those who were awake when the dawn appeared assented at once to the brilliant demonstration. We are better prepared to-day; and a great discovery like that of Schaudinn is immediately put to the test by experts in many lands, and a verdict is given in a few months. We may have become more plastic and receptive, but I doubt it; even our generation—that great generation of the last quarter of the nineteenth century, had a practical demonstration of the slowness of the acceptation of an obvious truth in the long fight for the aseptic treatment of wounds. There may be present some who listened, as I did in October, 1873, to an introductory lecture at one of the largest of the metropolitan schools, the burden of which was the finality of surgery. The distinguished author and teacher, dwelling on the remarkable achievements of the past, concluded that the art had all but reached its limit, little recking that within a mile from where he spoke, the truth for which he and thousands had been striving—now a conscious possession in the hands of Joseph Lister—would revolutionize it. With scores of surgeons here and there throughout the world this truth had been a latent possession. Wounds had healed *per primam* since Machaon's day; and there were men before Joseph Lister who had striven for cleanliness in surgical technique; but not until he appeared could a great truth become so manifest that it everywhere compelled acquiescence. Yet not without a battle—a long and grievous battle, as many of us well knew who had to contend in hospitals with the opposition of men who could not—not who would not—see the truth.

Sooner or later—insensibly, unconsciously—the iron

yoke of conformity is upon our necks; and in our minds, as in our bodies, the force of habit becomes irresistible. From our teachers and associates, from our reading, from the social atmosphere about us we catch the beliefs of the day, and they become ingrained —part of our nature. For most of us this happens in the haphazard process we call education, and it goes on just as long as we retain any mental receptivity. It was never better expressed than in the famous lines that occurred to Henry Sidgwick in his sleep:

> We think so because all other people think so;
> Or because—or because—after all, we do think so;
> Or because we were told so, and think we must think so;
> Or because we once thought so, and think we still think so;
> Or because, having thought so, we think we will think so.

In departing from any settled opinion or belief, the variation, the change, the break with custom may come gradually; and the way is usually prepared; but the final break is made, as a rule, by some one individual, the masterless man of Kipling's splendid allegory, who sees with his own eyes, and with an instinct or genius for truth, escapes from the routine in which his fellows live. But he often pays dearly for his boldness. Walter Bagehot tells us that the pain of a new idea is one of the greatest pains to human nature. 'It is, as people say, so upsetting; it makes you think that, after all, your favourite notions may be wrong, your firmest beliefs ill-founded; it is certain that till now there was no place allotted in your mind to the new and startling inhabitant; and now that it has conquered an entrance, you do not at once see which of your old ideas it will not turn out, with which of them it can be reconciled, and with which it is at essential enmity.' It is on this account that the man who expresses a new idea is very

apt to be abused and ill-treated. All this is common among common men, but there is something much worse which has been illustrated over and over again in history. How eminent soever a man may become in science, he is very apt to carry with him errors which were in vogue when he was young—errors that darken his understanding, and make him incapable of accepting even the most obvious truths. It is a great consolation to know that even Harvey came within the range of this law—in the matter of the lymphatic system —it is the most human touch in his career.

By no single event in the history of science is the growth of truth, through the slow stages of acquisition, the briefer period of latent possession, and the for us glorious period of conscious possession, better shown than in the discovery of the circulation of the blood. You will all agree with me that a Fellow of this college must take his courage in both hands who would, in this place and before this audience, attempt to discuss any aspect of this problem. After nearly three centuries of orations the very pictures and books in this hall might be expected to cry out upon him. But I have so taken my courage, confident that in using it to illustrate certain aspects of the growth of truth I am but obeying the command of Plato, who insists that principles such as these cannot be too often or too strongly enforced. There is a younger generation, too, the members of which are never the worse for the repetition of a good story, stale though it may be in all its aspects to their elders; and then there is that larger audience to be considered to which the season is never inappropriate to speak a word.

II.

The sixteenth century, drawing to a close, had been a period of acquisition unequalled in history. Brooding over the face of the waters of mediaevalism, the spirit of the Renaissance brought forth a science of the world and of man which practically created a new heaven and a new earth, and the truths announced by Copernicus and Galileo far transcended

> the searching schoolmen's view
> And half had staggered that stout Stagyrite.

Among other things, it had given to medicine a new spirit, a new anatomy, and a new chemistry. In the latter part of the fifteenth century Hippocrates and Galen came to their own again. A wave of enthusiasm for the fathers in medicine swept over the profession; and for at least two generations the best energies of its best minds were devoted to the study of their writings. How numerous and important is that remarkable group of men, the medical humanists of the Renaissance, we may judge by a glance at Bayle's *Biographie Médicale*, in which the lives are arranged in chronological order. From Garbo of Bologna, surnamed the expositor, to Rabelais, more than 150 biographies and bibliographies are given, and at least one-half of these men had either translated or edited works of the Greek physicians. Of our founder, one of the most distinguished of the group, and of his influence in reviving the study of Galen and so indirectly of his influence upon Harvey, Dr. Payne's story still lingers in our memories. Leonicenus, Linacre, Gonthier, Monti, Koch, Camerarius, Caius, Fuchs, Zerbi, Cornarus, and men of their stamp not only swept away Arabian impurities from the medicine of

the day, but they revived Greek ideals and introduced scientific methods.

The great practical acquisition of the century was a new anatomy. Vesalius and his followers gave for the first time an accurate account of the structure of the human body, and while thus enlarging and correcting the work of Galen, contributed to weaken the almost divine authority with which he dominated the schools. Nearly another century passed before chemistry, in the hands of Boyle and others, reached its modern phase, but the work of Paracelsus, based on that of the 'pious Spagyrist', Basil Valentine, by showing its possibilities, had directed men's minds strongly to the new science. Of the three, the new spirit alone was essential, since it established the intellectual and moral freedom by which the fetters of dogma, authority, and scholasticism were for ever loosened from the minds of men.

Into this world, we may say, stepped a young Folkestone lad, when, on the last day of May, 1593, he matriculated at Cambridge. Harvey's education may be traced without difficulty, because the influences which shaped his studies were those which had for a century prevailed in the profession of this country. We do not know the reason for selection of Caius College, which, so far as I can gather, had no special connexion with the Canterbury school. Perhaps it was chosen because of the advice of the family physician, or of a friend, or of his rector; or else his father may have known Caius; or the foundation may already have become famous as a resort for those about to 'enter on the physic line'. Or, quite as likely, as we so often find in our experience, some trivial incident may have turned his thoughts towards medicine. When he came

up in 1593, there were those of middle age who could tell racy stories of Caius, the co-founder of the college, against whose iron rule they had rebelled. 'Charged not only with a show of a perverse stomach to the professors of the Gospel, but with Atheism,' the last days of Caius's noble life were embittered by strife and misunderstanding. Doubtless the generous souls among them had long since learned to realize the greatness of his character, and were content to leave 'the heat of his faith to God's sole judgement, and the light of his good works to men's imitation', with which words, half a century later, the inimitable Fuller concludes a short sketch of his life. I like to think that, perhaps, one of these very rebels, noting the studious and inquisitive nature of Harvey, had put into the lad's hand the little tractate, *De libris propriis*, from which to glean a knowledge of the life and works of their great benefactor.

The contemplation of such a career as that of Caius could not but inspire with enthusiasm any young man. No one in the profession in England had before that time reached a position which I may describe as European. An enthusiastic student and the friend of all the great scholars of the day; a learned commentator on the works of the Fathers; the first English student in clinical medicine; a successful teacher and practitioner; a keen naturalist; a liberal patron of learning and letters; a tender and sympathetic friend—Johannes Caius is one of the great figures in our history. Nor need I dwell, before this audience, on his devotion to our interests, other than to say that the memory of no Fellow on our roll should be more precious to us. Four years hence, on October 6, will occur the quatercentenary of his birth. As well in love as in gratitude, we could celebrate it in no more appropriate manner,

and in none that would touch his spirit more closely, than by the issue of a fine edition of his principal works (including the MS. annals of the College). For the preparation of this there are those among us well fitted, not less by veneration for his memory than by the possession of that critical scholarship which he valued so highly.

When Harvey set out on the grand tour, Italy was still the *mater gloriosa studiorum*; to which one hundred years earlier, so tradition says, Linacre on leaving had erected an altar. The glamour of the ideals of the Renaissance had faded somewhat since the days when John Free, an Oxford man, had made the ancient learning his own; and had so far bettered the instruction of his masters that he was welcomed as a teacher in Padua, Ferrara, and Florence. In a measure, too, the national glory had departed, dimmed amid the strife and warfare which had cost the old republics their independence. Many years earlier Fracastorius, one of our medical poets, had sung of her decadence:

> To what estate, O wretched Italy,
> Has civil strife reduc'd and moulder'd Thee!
> Where now are all thy ancient glories hurl'd?
> Where is thy boasted Empire of the world?
> What nook in Thee from barbarous Rage is freed
> And has not seen thy captive children bleed?[1]

And matters had not improved but had grown worse. In the sixteenth century Italian influence had sunk deeply into the social, professional, and commercial life of England, more deeply, indeed, than we appreciate;[2] and it was not for a generation or two later that the candlesticks were removed from the Cisalpine towns to

[1] *Syphilis.* Englished by N. Tate, 1686.

[2] *Italian Renaissance in England,* Einstein. Macmillan, 1902.

Montpellier, Paris, and Leyden. In 1593 a well-to-do young Englishman who wished to study medicine thoroughly went to North Italy, and most naturally to Padua—'fair Padua, nursery of the arts'—whose close affiliations with us may be gathered from the fact that, of universities next to Oxford and Cambridge, she has given us more Presidents than any other. In the years that had passed since Vesalius had retired in disgust, the fame of its anatomical school had been well maintained by Fallopius, Columbus, and Fabricius, worthy successors of the great master. Of each may be said what Douglas says of the first named: '*In docendo maxime methodicus, in medendo felicissimus, in secando expertissimus.*' While the story of Harvey's student life can never be told as we could wish, we know enough to enable us to understand the influences which moulded his career. In Fabricius he found a man to make his life-model. To the enthusiastic teacher and investigator were added those other qualities so attractive to the youthful mind, generous sympathies and a keen sense of the wider responsibilities of his position, as shown in building, at his own expense, a new anatomical theatre for the University. Wide as was the range of his master's studies, embracing not alone anatomy but medicine and surgery, the contributions by which he is most distinguished are upon subjects in which Harvey himself subsequently made an undying reputation. The activity of his literary life did not begin until he had been teaching nearly forty years, and it is a fact of the highest significance that, corresponding to the very period of Harvey's stay in Padua, Fabricius must have been deep in the study of embryology and of the anatomy of the vascular system. His great work on generation was the model on which Harvey based his

own, in some ways, more accurate studies—studies in which, as my colleague Professor Brooks of the Johns Hopkins University has pointed out, he has forestalled Wolf and von Baer.

The work of Fabricius which really concerns us here is the *de Venarum Ostiolis*. Others before him had seen and described the valves of the veins, Carolus one of the great Stephani, Sylvius and Paul Sarpi. But an abler hand in this work has dealt with the subject, and has left us a monograph which for completeness and for accuracy and beauty of illustration has scarcely its equal in anatomical literature. Compare Plate VII, for example, with the illustrations of the same structures in the Bidloo or the Cowper *Anatomy*, published nearly one hundred years later; and we can appreciate the advantages which Harvey must have enjoyed in working with such a master. Indeed, it is not too far-fetched to imagine him, scalpel in hand, making some of the very dissections from which these wonderful drawings were taken. But here comes in the mystery. How Fabricius, a man who did such work—how a teacher of such wide learning and such remarkable powers of observation, could have been so blinded as to overlook the truth which was tumbling out, so to speak, at his feet, is to us incomprehensible. But his eyes were sealed, and to him, as to his greater predecessors in the chair, clear vision was denied. The dead hand of the great Pergamite lay heavy on all thought, and Descartes had not yet changed the beginning of philosophy from wonder to doubt. Not without a feeling of pity do we read of the hopeless struggle of these great men to escape from slavish submission to authority. But it is not for us in these light days to gauge the depth of the sacred veneration with which they regarded the Fathers. Their

mental attitude is expressed in a well-known poem of Browning's:

> those divine men of old time
> Have reached, thou sayest well, each at one point
> The outside verge that rounds our faculty,
> And where they reached who can do more than reach?

Willing to correct observations or to extend anatomy by careful dissection, it was too much to expect from them either a new interpretation of the old facts or a knowledge of the new method by which those facts could be correctly interpreted.

The ingenious explanation which Fabricius gave of the use of the valves of the veins—to serve as dams or checks to the flow of the blood, so that it would not irrigate too rapidly and overflow the peripheral vessels to the deprivation of the upper parts of the limbs—shows how the old physiology dominated the most distinguished teacher of the time in the most distinguished school of Europe. This may have been the very suggestion to his pupil of the more excellent way. Was it while listening to this ingenious explanation of his master that, in a moment of abstraction—dimly dreaming, perhaps, of an English home far away and long forsaken—that there came to Harvey a heaven-sent moment, a sudden inspiration, a passing doubt nursed for long in silence, which ultimately grew into the great truth of 1616?[1]

The works of Vesalius, of Fallopius, and of Fabricius effected a revolution in anatomy, but there was not at the close of the sixteenth century a new physiology. Though he had lost an anatomical throne, Galen ruled

[1] Boyle states that in the only conversation he ever had with him, Harvey acknowledged that a study of the valves of the veins had led him to the discovery of the circulation of the blood.

absolutely in all conceptions of the functions of the body, and in no department more serenely than in that relating to the heart, the blood and its movements. Upon his views I need not dwell further than to remind you that he regarded the liver as the source of the blood, of which there were two kinds, the one in the veins, the other in the arteries, both kinds in ceaseless ebb and flow, the only communication between these closed systems being through pores in the ventricular septum. He knew the lesser circulation, but thought it only for the nutrition of the lungs. The heart was a lamp which is furnished with oil by the blood and with air from the lungs. Practically until the middle of the seventeenth century Galen's physiology ruled the schools, and yet for years the profession had been in latent possession of a knowledge of the circulation. Indeed, a good case has been made out for Hippocrates, in whose works occur some remarkably suggestive sentences.[1] In the sixteenth century the lesser circulation was described with admirable fullness by Servetus and by Columbus, and both Sarpi and Caesalpinus had Hippocratic glimmerings of the greater circulation. These men, with others doubtless, were in latent possession of the truth. But every one of them saw darkly through Galenical glasses, and theirs was the hard but the common lot never to reach such conscious possession as everywhere to make men acquiesce. One must have the disinterestedness of the dead to deal with a problem about which controversy has raged, and in which national issues have been allowed to blur the brightness of an image which would be clear as day to those with eyes to see. Nor would I refer to a matter long since settled by those best competent to judge, had

[1] Willis's *Harvey*, pp. 21–2.

not the well-known work of Luciani, the distinguished Professor of Physiology at Rome, appeared recently in German dress, edited by Professor Verworn, and spread broadcast views to which, with a chauvinism unworthy of their history, our Italian brethren still adhere. It has been well said 'that he alone discovers who proves', and in the matter of the circulation of the blood, this was reserved for the pupil of Fabricius. Skipping many arduous years we next meet him as Lumleian Lecturer to the College.

III.

The really notable years in the annals of medicine are not very numerous. We have a calendar filled with glorious names, but among the saints of science, if we know an era it is as much as can be expected—perhaps because such men are less identified with achievements than representative of the times in which they lived. With many of our greatest names we cannot associate any fixed dates. The Grecians who made Hippocrates possible, live in memory with some theory, or a small point in anatomy, or in regard to the place of their birth; while the 'floruit' cannot always be fixed with accuracy.

Hippocrates himself, Erasistratus, Galen, and Araetius have no days in our calendar. We keep no festival in their honour as the churches do those of St. Jerome and St. Chrysostom. It is not until after the Renaissance that certain years (*anni mirabiles*) stand out in bold relief as connected with memorable discoveries, or with the publication of revolutionary works. Nevertheless, only a few in each century; even the sixteenth, so rich in discoveries, has not more than five or six such years, and not one of them is connected with work done in

this country. As to the seventeenth century, it is hard to name four made memorable by the announcement of great discoveries or the publication of famous works; in the eighteenth century not three, while in the century just completed, though it is replete with extraordinary discoveries, one is hard pressed to name half a dozen years which flash into memory as made ever memorable by great achievements. Of the three most important, anaesthesia, sanitation, and antiseptic surgery, only of the first can the date be fixed, 1846, and that for its practical application. For the other two discoveries, who will settle upon the year in which the greatest advance was made, or one which could be selected for an anniversary in our calendar?

There is one *dies mirabilis* in the history of the College—in the history, indeed, of the medical profession of this country, and the circumstances which made it memorable are well known to us. At ten o'clock on a bright spring morning, April 17, 1616, an unusually large company was attracted to the New Anatomical Theatre of the Physicians' College, Amen Street. The second Lumleian Lecture of the annual course, given that year by a new man, had drawn a larger gathering than usual, due in part to the brilliancy of the demonstration on the previous day, but also it may be because rumours had spread abroad about strange views to be propounded by the lecturer. I do not know if at the College the same stringent rules as to compulsory attendance prevailed as at the Barber Surgeons' Hall. Doubtless not,[1] but the President, and Censors, and Fellows would be there in due array; and with the help

[1] Mr. William Fleming, the College Bedell, calls my attention to the Statutes of that period. Under penalty of a fine all Fellows and candidates were commanded to attend for at least five years.

of the picture of 'The Anatomy Lecture by Bannister', which is in the Hunterian collection, Glasgow, and a photograph of which Dr. Payne has recently put in our library, we can bring to mind this memorable occasion. We see the 'Anatomy', one of the six annually handed over to the College, on the table, the prosector standing by the skeleton near at hand, and very probably on the wall the very *Tabulae* of dissection of the arteries, veins, and nerves that hang above us to-day. But the centre of attention is the lecturer—a small dark man, wand in hand, with black piercing eyes, a quick vivacious manner, and with an ease and grace in demonstrating, which bespeaks the mastery of a subject studied for twenty years with a devotion that we can describe as Hunterian. A Fellow of nine years' standing, there was still the salt of youth in William Harvey when, not as we may suppose, without some trepidation, he faced his auditors on this second day—a not uncritical audience, including many men well versed in the knowledge of the time and many who had heard all the best lecturers of Europe.

The President, Henry Atkins, after whose name in our Register stands the mysterious word 'Corb', had already had his full share of official lectures, less burdensome three hundred years ago than now. Let us hope the lecture of the previous day had whetted his somewhat jaded appetite. The Censors of the year formed an interesting group: John Argent, a Cambridge man, a 'great prop of the college', and often President, of whom but little seems known; Richard Palmer, also of Cambridge, and remembered now only for his connexion with Prince Henry's typhoid fever, as Dr. Norman Moore has told us; Mathew Gwinne of Oxford, first Professor of Physic at Gresham College and a play-

wright of some note in his day; and Theodore Goulston of Merton College, one of our great benefactors, and for 267 years past and gone purveyor-in-chief of reputation to the younger Fellows of the College. Mayerne would be there, not yet a Fellow, but happy in his escape from the Paris Faculty; still dusty with conflict, he would scent the battle afar in the revolutionary statements which he heard. Meverell, fresh from incorporation at Cambridge, also not yet a Fellow; Moundeford, often President, whose little book *Vir Bonus* sets forth his life. Paddy, a noteworthy benefactor, a keen student, still gratefully remembered at Oxford, would have strolled in with his old friend Gwinne; Baldwin Hamey the elder, also a benefactor, would be there, and perhaps he had brought his more interesting son, then preparing to enter Leyden, whose memory should be ever green among us. Let us hope Thomas Winston, probably an old fellow-student at Padua, and later appointed Professor of Physic at Gresham College, was absent, as we can then be more charitable towards the sins of omission in his work on *Anatomy*, published after his death, which, so far as I can read, contrary to the statement of Munk (Roll of the College), contains no word of the new doctrine. As an old Paduan, and fresh from its anatomical school, the younger Craige would not be absent. Fludd, the Rosicrucian, of course, was present; attracted, perhaps, by rumours of anti-Galenical doctrines which had served to keep him out of the College; nor would he be likely to be absent at the festival of one whom he calls his 'physicall and theosophicall patron'. And certainly on such an occasion that able Aberdonian, Alexander Reid, would be there, whose Σωματογραφία had just appeared,[1] with an extraordinary full account

[1] Copy in Bodleian Library.

of the vascular system. Reid was a good anatomist, one of our most distinguished Medico-Chirurgical Fellows, and a liberal benefactor. If, as has been stated, he was not a convert on account of his age, it was on account of his youth, for the Harveian doctrine, if in meagre form, is to be found in the later editions (5th) of his *Manual.* But we would miss Lodge, the poet, 'cried up to the last for physic,' as he had recently started for the Continent. And we may be sure that Harvey's old fellow-students at Padua—Fortescue, Fox, Willoughby, Mounsell, and Darcy—would honour their friend and colleague with their presence; and Edward Lister, also a fellow-Paduan, the first of his name in a family which has given three other members to our profession—two distinguished and one immortal.[1] It was not a large gathering, as the Fellows, members, licentiates, and candidates numbered only about forty; but as the lecture was a great event in the community, there would be present many interested and intelligent laymen, of the type of Digby, and Ashmole, and Pepys—the 'curious', as they were called, for whom throughout the seventeenth century the anatomy lecture equalled in attraction the play. Delivered in Latin, and interspersed here and there with English words and illustrations, there were probably more who saw than who comprehended, as Sir Thomas Browne indicated to his son Edward when he lectured at Chirurgeons' Hall.

It is a fortunate, and perhaps a unique, circumstance in bibliography that the manuscript of this course of lectures should have been preserved, and that we should be able to follow step by step the demonstration

[1] I followed Munk's *Roll*, but Lord Lister tells me that he does not know of a relationship. I am sorry, as Martin Lister deserves the honour.

—a long and formidable procedure, as the whole anatomy of the thoracic organs was discussed. I dare say there was a prolonged break between the morning and the afternoon lecture 'for a fine dinner', such as Pepys described, when, on February 27, 1663, he went with Harvey's pupil, Scarborough, to Chirurgeons' Hall and was used with 'extraordinary great respect'. Towards the close, after discussing, in novel and modern terms, the structure and action of the heart, Harvey summed up in a few sentences the conclusion of the matter. They stand as follows in the *Praelectiones* (published by the College in 1886):

W. H. constat per fabricam cordis sanguinem
per pulmones in Aortam perpetuo
transferri, as by two clacks of a
water bellows to rayse water
constat per ligaturam transitum sanguinis
ab arteriis ad venas
unde perpetuum sanguinis motum
in circulo fieri pulsu cordis.

Probably few in the lecture hall appreciated the full meaning of these words, which to some must have seemed a blot on the whole performance; while others, perhaps, all with the feelings of the fishes after St. Anthony's well-known sermon,

Much delighted were they,
But preferred the old way,

returned to their homes wondering what he would say on the morrow when the 'divine banquet of the brain' was to be spread before them.

One thing was certain—the lecture gave evidence of a skilled anatomist of remarkably wide experience and well versed in literature from Aristotle to Fabricius. While Harvey could agree with John Hunter, who

states in a manuscript introductory lecture in the College library—'I deliver nothing I have not seen and observed myself'—he could not add with him, 'I am not a reader of books.' Nearly one hundred references to some twenty authors occur in the manuscript of the thorax, or, as he calls it, the 'parlour' lecture.

It is a great pity that we have no contemporary account of the impression on such men as Mayerne or Reid of the new doctrines, for which we have the author's statement that they were taught annually and elaborated. So far as I know there is no reference to show that the lectures had any immediate influence in the profession, or indeed that the subject-matter ever got beyond the circle of the college. We are not without a first-hand account by the author of his reception: 'These views as usual pleased some more, others less; some chid and calumniated me, and laid it to me as a crime that I had dared to depart from the precepts and opinions of all anatomists; others desired further explanation of the novelties.'

It is difficult for us to realize the mental attitude of the men who listened year by year as the turn of the 'Parlour Lecture' came. Their opinions, no less firmly held than is our positive knowledge, did not get much beyond: 'The great dictator Hippocrates puts us in mind of it, Galen has a thousand times inculcated the same, the prince of the Arabian tribe, Avicen, has set his seal unto it.' This expresses their mental state, and such a heresy as a general circulation could scarcely be appreciated; and in a man of such good parts as Harvey would in pity be condoned, just as we overlook the mild intellectual vagaries of our friends.

Bootless to ask, impossible to answer, is the question why Harvey delayed for twelve years the publication

of his views. He seems to have belonged to that interesting type of man, not uncommon in every age, who knows too much to write. It is not a little remarkable that this reticence of learning has been a strong mental feature in some of the greatest of discoverers. Perhaps it was the motive of Copernicus, who so dreaded the prejudices of mankind that for thirty years he is said to have detained in his closet the *Treatise of Revolutions*. From what Harvey says, very much the same reasons restrained the publication of his work. To the lesser circulation, with the authority of Galen and Columbus to support it, men 'will give their adhesion', but the general circulation 'is of so novel and unheard-of character that I not only fear injury to myself from the envy of a few, but I tremble lest I have mankind at large for my enemies, so much doth wont and custom, that has become as another nature, and doctrine once sown and that hath struck deep root and rested from antiquity, influence all men'. He felt, as he says to Riolan, that it was in some sort criminal to call in question doctrines that had descended through a long succession of ages and carry the authority of the ancients; but he appealed unto Nature that bowed to no antiquity and was of still higher authority than the ancients. Men have been for years in conscious possession of some of the greatest of truths before venturing to publish them. Napier spent twenty years developing the theory of Logarithms; and Bacon kept the *Novum Organum* by him for twelve years, and year by year touched it up—indeed, Rowley states that he saw twelve copies. Two other famous discoveries by Englishmen have the same curious history—the two which can alone be said to be greater than the demonstration of the circulation of the blood. Zachariah

Wood speaks of Harvey as the surmiser of the little world, to distinguish him from another Englishman who first went about the greater world. But a greater than both—Isaac Newton—had grasped the secret of a cosmic circulation, and brooded in silence over the motion of the spheres for more than twenty years before publishing the *Principia*. Between the writing of the rough sketch in 1842 and the appearance of the *Origin of Species* seventeen years elapsed; and from the date of the journal notes, 1836, in which we have the first intimation of Darwin's theory, more than twenty years. In Harvey's case this intellectual reticence, this hesitation 'to quit the peaceful haven', as he says, has cost us dear. Only a happy accident gave us the *De Generatione*, and the College can never be too grateful to Sir George Ent for that Christmas visit, 1650, so graphically described, and to which we owe one of the masterpieces of English medicine. How many seventeenth-century treatises we could have spared to have had the *Practice of Medicine conformable to his Thesis of the Circulation of the Blood!* How instructive his prospective *Medical Observations* would have been we can gather from the remarkable series of cases scattered through the manuscript notes and his published writings. His 'treatise apart' on *Eventilation* or *Respiration*; the *Medical Anatomy*, or *Anatomy in its Application to Medicine*, as he says, 'I also intend putting to press'; the work 'from observations in my possession' on *Organs of Motion in Animals*—all of these, with the work on *Generation in Insects*, and others mentioned by Dr. Merrett,[1] the then library keeper, 1667, were probably dispersed when those sons of Belial ransacked his chambers at Whitehall.

[1] Munk, *Roll of the College*, vol. i, p. 132.

'Still the die is cast, and my trust is in the love of truth and the candour that inheres in cultivated minds.' With these words he consoles himself, knowing from experience that the publication of even a portion of the work, as in one place he calls the little book, would raise a tempest. Zachariah Wood in the preface to the English edition, 1673, expresses what many of his contemporaries must have felt, 'Truly a bold man indeed, O disturber of the quiet of physicians! O seditious citizen of the Physical Commonwealth! who first of all durst oppose an opinion conformed for so many ages by the consent of all.' De Bach of Amsterdam describes the dilemma in which teachers found themselves: 'This new thing I did examine, which the first entrance did seem very easily to be refuted, but being weighed in a just balance, and having added to reason my own ey-sight it was found inexpugnable, nay (the very prick of truth enforcing) to be embraced with both arms. What should I doe? Must Hippocrates be left, Galen slighted? No, if we follow the truth senced with reason and our sense, we are still Hippocrates his, we are still Galens' (English edition, 1653).

The history of the next thirty years illustrates the truth of Locke's dictum in the struggle for acceptance. Not the least interesting part of the story, it should be told at greater length and with more detail than it has yet received—more than I am able to give it. That the repeated demonstrations, aided by the strong personal influence of the man, brought the College, as a body, to the new views is witnessed rather by the esteem and affection the Fellows bore to Harvey than by any direct evidence. The appearance of the book in 1628 made no great stir; it was not a literary sensation—a not uncommon fate of epoch-making works, the authors of

which are too far ahead of their contemporaries to be appreciated. The same event happened to Newton's *Principia*; as Sir William Petty remarks, 'I have not met with one man that put an extraordinary value on the book.'

Among Englishmen, Primrose alone, brought up among the strictest sect of the Galenists, and at the time not a Fellow—wrote a criticism from the old standpoint (1632), and remained unconvinced twelve years later, as his controversy with Regius shows. And only one special treatise in favour of the circulation was written in England—that of Sir George Ent, a pupil and friend of Harvey, who wrote (1641) specially against Parisanus, a Venetian, a foeman quite unworthy of his quill. In the universities the new doctrine rapidly gained acceptance—in Cambridge through the influence of Glisson, while in part to Harvey's work and influence may be attributed that only too brief but golden renaissance of science at Oxford. A little incident mentioned in the autobiographical notes of the celebrated Wallis shows how the subject was taken up quite early in the universities: 'And I took into it the speculative part of physick and anatomy as parts of natural philosophy, and, as Dr. Glisson has since told me, I was the first of his sons who (in a public disputation) maintained the circulation of the blood, which was then a new doctrine, though I had no design of practising physick.' This was in the early 'thirties'. But the older views were very hard to displace, and as late as 1651 we find such intelligent members of the 'invisible college' as Boyle and Petty carrying out experiments together in Ireland to satisfy themselves as to the truth of the circulation of the blood.

It took much longer for the new views to reach the

textbooks of the day. From no work of the period does one get a better idea of the current anatomical and physiological teaching in London than from Crooke's *Body of Man* (1615 and 1631). Collected out of Vesalius, Plantinus, Platerius, Laurentius, Valverda, Bauchinus, and others, it is an epitome of their opinions, with the comments of the professor who read the anatomy lecture to the Company of the Barber-Surgeons. In the preface to the first edition he speaks of the contentment and profit he had received from Dr. Davies's Lumleian Lectures at the College of Physicians. There is no indication in the second edition that he had benefited by the instruction of Dr. Davies's successor. Galen is followed implicitly, with here and there minor deviations. The views of Columbus on the lesser circulation are mentioned only to be dismissed as superfluous and erroneous. The Gresham Professor of the day, Dr. Winston, makes no mention of the new doctrine in his *Anatomy Lectures* which were published after his death, 1651, and are of special interest as showing that at so late a date a work could be issued with the Galenical physiology unchanged. In Alexander Reid's *Manual*, the popular textbook of the day, the Harveian views are given in part in the fifth edition, in which, as he says in the preface, 'the book of the breast' is altogether new—an item of no little interest, since he was a man advanced in years, and, as he says, 'the hourglass hasteneth, and but a few sands remain unrun.' Highmore, the distinguished Dorsetshire anatomist, and a pupil of Harvey, in his well-known *Anatomy* published in 1651, gives the ablest exposition of his master's views that had appeared in any systematic work of the period, and he urges his readers to study the *de Motu Cordis* as 'fontem ipsum' from which to get clearer knowledge. He quotes an

appropriate motto for the period—*laudamus veteres: sed nostris utimur annis.* But even so late as 1671 the old views were maintained in the English edition of Riolan. And yet the knowledge of Harvey's views must have spread broadcast, not only in the profession, but in that large outside circle of distinguished men who felt the new spirit of science working in their veins. From converse or from the Lumleian lectures, which no doubt he often attended, Kenelm Digby must have had the information about Harvey's views on generation, as at the date of the issue of his *Two Treatises*, 1644, they had not been published anywhere. While he knew well the motion of the blood as expounded by Harvey, and having, in making his great antidote, studied the action of the viper's heart, Digby, like Descartes, could not emancipate himself from the old views, as shown in the following passage: 'But if you desire to follow the blood all along every steppe, in its progresse from the hart round about the body, till it returne back againe to its center, Doctor Harvey, who most acutely teacheth this doctrine, must be your guide. He will show you how it issueth from the hart by the arteries; from whence it goeth on warming the flesh, untill it arrive to some of the extremities of the body: and by then it is grown so coole (by long absence from the fountaine of its heate; and by evaporating its owne stocke of spirits, without any new supply) that it hath need of being warmed anew; it findeth itself returned backe againe to the hart, and is there heated againe, which returne is made by the veines, as its going forwardes, is performed only by the arteries.'

Sir William Temple well expresses the attitude of mind of the intellectual Philistine of the time, who looked for immediate results. Speaking of the work of Harvey and of Copernicus he says: 'Whether either of

these be modern discoveries or derived from old foundations is disputed; nay, it is so too, whether they are true or no; for though reason may seem to favour them more than the contrary opinions, yet sense can hardly allow them, and to satisfy mankind both these must concur. But if they are true, yet these two great discoveries have made no change in the conclusions of Astronomy nor in the practice of Physic, and so have been but little use to the world, though, perhaps, of much honour to the authors.'[1] It is pleasant to notice that our old friend, Sir Thomas Browne, with his love of paradox, declared that he preferred the circulation of the blood to the discovery of America.

Of the reception of Harvey's views in Holland and Germany there is nothing to add to the admirable account given by Willis. The early and strenuous advocacy of Descartes must have influenced the Dutch physicians; but in this, as in so many other things, the infection of his early years proved too powerful, and he could not get rid of the 'ancient spirits'. Of the discovery of the circulation he says[2] it is 'la plus belle et la plus utile que l'on pût faire en médecine'. 'Tout à fait contraire au sein (*sic*) touchant le mouvement du cœur,' which he held to be due to an ebullition of the spirits—a sort of ferment (*espèce de levain*) existing in it. Much more actively discussed in Holland than elsewhere, the writings of Drake, Walaeus, Regius, Plempius, Sylvius, de Bach, Conringius, T. Bartholini (the Dane), and others threshed out the whole question very thoroughly, and their views, with those of Hoffman, Slegel, and others, are referred to by Willis and given in greater detail by Riolan.[3]

[1] *Works*, 1814, vol. iii, p. 293. [2] Cousins's edition, vol. ix, p. 159.
[3] *Opuscula Anatomica*. London, 1649.

In the oft-quoted statement that Harvey, 'conquering envy, hath established a new doctrine in his lifetime,' Hobbes was right so far as England and Holland are concerned. But it was far otherwise in France, where it met with a bitter and protracted hostility. The Medical School of the University of Paris, at the time one of the best-organized and most important in Europe, declined to accept the circulation of the blood during his lifetime and for some years after his death. The history of the period is pictured for us in vivid colours in that *journal intime* which Gui Patin kept up with his friends, Spohn and Falconet of Lyons and the Belins (*père et fils*). With all his faults, particularly his scandalous lack of charity, one cannot but feel the keenest sympathy with this dear old man. Devoted to his saints, Hippocrates and Galen, Fernel and Duret, and to his teachers, Piêtre and Riolan, to him the circulation of the blood was never more than an ingenious paradox. To such a lover of books and of good literature everything can be forgiven, and in his letters we follow with deepest interest his vigorous campaign against his dear enemies, the *Cuisiniers arabesques*, who had enslaved people and physicians alike, the haemophobes, the chemists, the astrologers and the *stibiate*, or as he calls it, the *Stygiate* group. To him the Koran was less dangerous than the works of Paracelsus, the appearance of the new Geneva edition of which he deeply deplores. Reverence for Galen and friendship with Riolan, rather than any deep interest in the question, inspired his opposition. To him the new doctrine was ridiculous, and it was he who called the partisans of it *circulateurs* in allusion to the Latin word, circulator, meaning charlatan. In 1652 he writes to Spohn that the question is still open whether the blood passes through the septum

of the heart or through the lungs. In 1659 he promises to send him a work of Vinean against the circulation.[1] More extraordinary still is the fact that as late as 1670, twelve years after Harvey's death, the thesis of one Cordelle, a bachelor of medicine, publicly discussed the circulation of the blood, and Gui Patin, who presided, decided in the negative. The fiction of an ingenious narrator, *le doux songe* of Harvey, are the terms in which he speaks of it. The whole passage is worth quoting as possibly the last public denouncement of what seemed a rank heresy to the old Galenists: 'Supposer que le sang se meut toujours circulairement, que de la veine cave ascendante il tombe dans l'oreillette droite du cœur, que de là il aille traverser toute la substance du poumon pour retomber de là dans l'oreillette gauche en passant par la veine pulmonaire, et qu'enfin de là il soit projeté dans l'aorte et toutes les artères qui le feront passer dans les veines et dans le cœur, lui faisant par ce moyen suivre un circuit, voilà le doux songe de Harvey, la fiction d'un narrateur ingénieux, mais nullement prouvée par l'évidence. La circulation du sang, son transport circulaire par les vaisseaux, c'est l'enfantement d'un esprit oisif, un vrai nuage qu'embrassent les Ixions pour procréer les Centaurs et les monstres.'[2]

As I said, we can forgive a great deal to the man who has left us such a picture of seventeenth-century life, drawn, all unconsciously, with a master hand; and through the mists of prejudice and hate we can recognize the good sense which had the courage to protest against the *forfanterie arabesque et bézoardesque* in much of the therapeutics of the day.

[1] *Lettres*, vol. i, p. 324, édition 1694.
[2] Gui Patin, par Félix Larrieu. Paris, 1889.

Though a professor in the Paris Faculty and a brilliant lecturer, Patin at that time did not occupy such a distinguished position, nor was his opposition of such importance as that of Riolan—'John Riolan, the Son, the most experienced Physician in the Universitie of Paris, the Prince of Dissection of Bodies, and the King's professor, and Dean of Anatomie and of the knowledge of simples, chief physician to the queen-mother of Louis XIII'—as he is quaintly, but very truly, described by Harvey.[1] Brought up by his father to regard Hippocrates and Galen as the sources of all wisdom, the intensity of his zeal increased with his years until at last 'to see the physic of Galen kept in good repair' became the passion of his life. The deep pity of it all is that such mental blindness should have stricken a really great man, for he was a brilliant anatomist and teacher, the author of the best anatomical textbook of its day, a man of affairs, profoundly versed in literature, a successful practitioner, and for years the head of the profession in France.

The opposition of such a man was serious, and naturally had a profound influence. Not content with the comparatively brief statement in the *Encheiridion*, 1648, Riolan published in England the following year his *Opuscula Anatomica nova*, one very large section of which is taken up with the problem of circulation. It was this probably as much as a present of the Encheiridion that induced Harvey to break his long silence and to reply. After a report of a discussion upon a thesis in 1645 and a statement of objections, a most interesting discussion follows of the literature, in which the opinions of various writers are examined, particu-

[1] Title-page of English edition of the Letter.

larly those of Cartesius, Conringius, Walaeus, and Plempius.

It is quite possible that the second *Disquisition* of Harvey to Riolan, published with the first in duodecimo form at Cambridge in 1649, was brought out by Riolan's latter publication, though it is not directly referred to. Little did Harvey appreciate that his old friend was both blind and deaf—incapable of seeing obvious facts. It was not a question of being conversant with anatomy or of having had experience, on both of which points Harvey dwells at length. Riolan knew his anatomy as well as, or better, than any man of his generation. It was not that he would not—but he that could not—see the truth which was staring him in the face. As Reynaud[1] mentions, an occasional thesis (Fagon, 1663; Mattot, 1665) supporting the circulation did slip through the Faculty: but the official recognition in France did not come until 1673, when Louis XIV founded a special Chair of Anatomy at the Jardin des Plantes for the propagation of the new discoveries.

The satire of Molière and the *Arrêt Burlesque* of Boileau completed the discomfiture of the 'anticirculateurs', but it had taken nearly half a century to overcome the opposition of those who saw in the new doctrines the complete destruction of the ancient system of medicine.

IV.

Even when full grown in the conscious stage Truth may remain sterile without influence or progress on any aspects of human activity. One of the most remarkable

[1] *Les Médecins au Temps de Molière*, 1863.

of phenomena in mental biography is the failure of the Greeks to succeed after giving the world such a glorious start. They had every essential for permanent success: scientific imagination, keen powers of observation; and if in the days of Hippocrates the mathematical method of interrogating Nature prevailed rather than the experimental, Galen carried the latter to a degree of perfection never again reached until the time of Harvey. Only when placed in its true position in relation to Greek religion and philosophy, as has been done so skilfully by Gomperz,[1] do we realize the immensity of the debt we owe to those 'our young light-hearted masters'. And Gomperz makes clear the nature of the debt of Greek thought to the practical sense of the physicians. But alas! upon the fires they kindled were poured the dust and ashes of contending philosophies, and neither the men of the Alexandrian school nor the brilliant labours of the most encyclopaedic mind that has ever been given to medicine sufficed to replenish them. Fortunately, here and there amid the embers of the Middle Ages glowed the coals from which we have lighted the fires of modern progress. The special distinction which divides modern from ancient science is its fruitful application to human needs—not that this was unknown to the Greeks; but the practical recognition of the laws of life and matter has in the past century remade the world. In making knowledge effective we have succeeded where our masters failed. But this last and final stage, always of slow and painful

[1] The three volumes of his *Greek Thinkers*, now in English dress, should be studied by every young man who wishes to get at the foundations of philosophy. The picturesque style of Professor Gomperz and his strong sympathy with science add greatly to the interest of the work.

consummation, is evolved directly from truths which cannot be translated into terms intelligible to ordinary minds. Newton's great work influenced neither the morals nor the manners of his age, nor was there any immediate tangible benefit that could be explained to the edification or appreciation of the 'ordinary man' of his day; yet it set forward at a bound the human mind, as did such truths as were proclaimed by Copernicus, by Kepler, by Darwin, and others. In a less conspicuous manner Harvey's triumph was on the same high plane. There was nothing in it which could be converted immediately into practical benefit, nothing that even the Sydenhams of his day could take hold of and use. Not so much really in the demonstration of the fact of the circulation as in the demonstration of the method—the *Inventum mirabile* sought for by Descartes, the *Novum Organum* of Bacon—lies the true merit of Harvey's work. While Bacon was thinking, Harvey was acting; and before Descartes had left his happy school at La Flèche Harvey was using *la nouvelle méthode*; and it is in this way that the *de Motu Cordis* marks the break of the modern spirit with the old traditions. No longer were men to rest content with careful observation and with accurate description; no longer were men to be content with finely-spun theories and dreams, which 'serve as a common subterfuge of ignorance'; but here for the first time a great physiological problem was approached from the experimental side by a man with a modern scientific mind, who could weigh evidence and not go beyond it, and who had the sense to let the conclusions emerge naturally but firmly from the observations. To the age of the hearer, in which men had heard, and heard only, had succeeded the age of the eye, in which men had seen and had been

content only to see. But at last came the age of the hand—the thinking, devising, planning hand; the hand as an instrument of the mind, now reintroduced into the world in a modest little monograph of seventy-two pages, from which we may date the beginning of experimental medicine.

No great discovery in science is ever without a corresponding influence on medical thought, not always evident at first, and apt to be characterized by the usual vagaries associated with human effort. Very marked in each generation has been the change wrought in the conceptions of disease and in its treatment by epoch-making discoveries as to the functions of the body. We ourselves are deeply involved to-day in toxins and antitoxins, in opsonins, tulases, and extracts as a direct result of the researches in bacteriology and in internal secretion. There were sanguine souls in Harvey's day, who lamented with Floyer that the discovery had not brought great and general innovations into the whole practice of physic. But had the old Litchfield physician lived he would have seen the rise of a school based directly upon the studies of Harvey and Sanctorius, the brilliant reasonings of Descartes and the works of Bellini and Borelli. The mechanical school rose in its pride on solid foundations which appealed to practical men with singular force. Very soon that 'beatific epitome of creation', man, was 'marked out like a spot of earth or a piece of timber with rules and compasses', and the medical terminology of the day became unintelligible to the older practitioners who could make nothing of the 'wheels and pulley, wedges, levers, screws, cords, canals and cisterns, sieves and strainers', and they cracked their jokes on 'angles, cylinders, celerity, percussion, resistance, and such-like

terms which they said had no more to do with physic on the human body than a carpenter has in making Venice treacle or curing a fever'. Once accepted, men had a feeling that so important a discovery must change all the usual conceptions of disease. As has been said before, Harvey tells that he had in preparation a *Practice of Medicine conformable to his Thesis of the Circulation of the Blood*, and it soon became customary to put in the title-pages of works some reference to the new doctrine. Even Riolan's *Opuscula Anatomia* makes an allusion to it. Walaeus, a keen defender of Harvey, published in 1660 a little compendium of practice *ad circulationem sanguinis adornata*, but there is nothing in it to suggest any radical change in treatment. Rolfinck's *Dissertationes Anatomicae*, 1650, embracing the older and more recent views in medicine are *ad circulationem accommodatae*, and even as late as 1690 the well-known anatomy of Dionis was *suivant la circulation*. With the loss of his work on the *Practice of Medicine* it is impossible to say whether Harvey's own practice was modified in any way. To part from the spirits and humours must have left his attitude of mind very sceptical, and that his 'therapeutic way' was not admired (as Aubrey tells us) speaks for a change which may have set many against him. More important than any influence upon treatment was the irresistible change in the conceptions of disease caused by destruction of the doctrine of spirits and humours, which had prevailed from the days of Hippocrates. While Harvey, as he says, had in places to use the language of physiology, that is, the language of the day, he makes it very clear, particularly in the second letter to Riolan, that he will have none of the old doctrine to which the *de Motu Cordis* dealt the death blow.

But the moving hand reminds your orator, Mr. President, of a bounden duty laid upon him by our great Dictator to commemorate on this occasion by name all of our benefactors; to urge others to follow their example; to exhort the Fellows and Members to study out the secrets of Nature by way of experiment; and, lastly, for the honour of the profession, to continue in love and affection among ourselves. No greater tribute to Harvey exists than in these simple sentences in which he established this lectureship, breathing as they do the very spirit of the man, and revealing to us his heart of hearts. Doubtless, no one more than he rejoices that our benefactors have now become so numerous as to nullify the first injunction; and the best one can do is to give a general expression of our thanks, and to mention here and there, as I have done, the more notable among them. But this is not enough. While we are praising famous men, honoured in their day and still the glory of this College, the touching words of the son of Sirach remind us: 'Some there be that have no memory, who are perished as though they had never been, and are become as though they had never been born.' Such renown as they had, time has blotted out; and on them the iniquity of oblivion has blindly scattered her poppy. A few are embalmed in the biographical dictionaries; a few are dragged to light every year at Sotheby's, or the memory is stirred to reminiscence as one takes down an old volume from our shelves. But for the immense majority on the long roll of our Fellows—names! names! names!—nothing more; a catalogue as dry and meaningless as that of the ships, or as the genealogy of David in the Book of Chronicles. Even the dignity of the Presidential chair does not suffice to float a man down the few centuries that have passed since the foundation

of the College. Who was Richard Forster? Who was Henry Atkins? Perhaps two or three among us could tell at once. And yet by these men the continuity and organic life of the College has been carried on, and in maintaining its honour, and furthering its welfare, each one in his day was a benefactor, whose memory it is our duty, as well as our pleasure, to recall. Much of the nobility of the profession depends upon this great cloud of witnesses, who pass into the silent land—pass, and leave no sign, becoming as though they had never been born. And it was the pathos of this fate, not less pathetic because common to all but a few, that wrung from the poet that sadly true comparison of the race of man to the race of leaves!

The story of Harvey's life, and a knowledge of the method of his work, should be the best stimulus to the Fellows and Members to carry out the second and third of his commands; and the final one, to continue in love and affection among ourselves, should not be difficult to realize. Sorely tried as he must have been, and naturally testy, only once in his writings, so far as I have read, does the old Adam break out. With his temperament, and with such provocation, this is an unexampled record, and one can appreciate how much was resisted in those days when tongue and pen were free. Over and over again he must have restrained himself as he did in the controversy with Riolan, of whom, for the sake of old friendship, he could not find it in his heart to say anything severe. To-day his commands are easier to follow, when the deepened courtesies of life have made us all more tolerant of those small weaknesses, inherent in our nature, which give diversity to character without necessarily marring it. To no man does the right spirit in these matters come by nature, and I would urge upon

our younger Fellows and Members, weighing well these winged words, to emulate our great exemplar, whose work shed such lustre upon British Medicine, and whom we honour in this College not less for the scientific method which he inculcated than for the admirable virtues of his character.